

ABSTRACT OF THE DISCLOSURE

Systems and methods for planning a cryoablation procedure and for facilitating a cryoablation procedure utilize integrated images displaying, in a common virtual space, a three-dimensional model of a surgical intervention site based on digitized preparatory images of the site from first imaging modalities, simulation images of cryoprobes used according to an operator-planned cryoablation procedure at the site, and real-time images provided by second imaging modalities during cryoablation. The system supplies recommendations for and evaluations of the planned cryoablation procedure, feedback to an operator during cryoablation, and guidance and control signals for operating a cryosurgery tool during cryoablation. Methods are provided for generating a nearly-uniform cold field among a plurality of cryoprobes, for cryoablating a volume with smooth and well-defined borders, thereby minimizing damage to healthy tissues.